IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF MASSACHUSETTS

SKYLINE SOFTWARE SYSTEMS, INC., Plaintiff, v. KEYHOLE, INC., and GOOGLE INC. Defendants.	CIVIL ACTION NO. 06-10980 DPW

MEMORANDUM OF POINTS AND AUTHORITIES IN SUPPORT OF DEFENDANTS' MOTION FOR SUMMARY JUDGMENT OF ANTICIPATION BASED ON THE PUBLIC USE OF TERRAVISION

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Google	Defendants' Keyhole, Inc. and Google, Inc.
Skyline	Plaintiff Skyline Software Systems, Inc.
'189 Patent	U.S. Patent No. 6,496,189.
Undisputed Facts	Separate Statement of Undisputed Material Facts in Support of Defendants' Motions for Summary Judgment of Noninfringement and Anticipation
Feiner Decl.	Declaration of Professor Steven K. Feiner, Ph.D., in Support of Defendants' Motions for Summary Judgment of Noninfringement and Anticipation
Chang Decl.	Declaration of Carolyn Chang in Support of Defendants' Motions for Summary Judgment of Noninfringement and Anticipation
Lau Depo.	Depositions of Stephen Lau, taken on June 21, 2006 and June 22, 2006 (Chang Decl., Ex. 14).
MAGIC	Multidimensional Applications and Gigabit Internet Consortium (MAGIC Final Report at GOOG 358) or Multidimensional Applications and Gigabit Internetwork Consortium (MAGIC IEEE Article at GOOG 347).
MAGIC Final Report	Yvan G. Leclerc, "MAGIC Final Report," SRI International, Menlo Park, CA (May 1996), available at http://www.ai.sri.com/~magic/magic-final-report.html (GOOG 000358-70) (Chang Decl., Ex. 21).
MAGIC IEEE Article	Barbara Fuller & Ira Richer, "The MAGIC Project: From Vision to Reality," *IEEE Network*, Vol. 10, No. 3, pp. 15-25 (May/June 1996) (GOOG 000346-25) (Chang Decl., Ex. 22)
TerraVision Tech Note	Y.G. Leclerc & S.Q. Lau, Jr., "TerraVision: A Terrain Visualization System," Technical Note 540, SRI International, Menlo Park, CA (April 22, 1994), available at http://www.ai.sri.com/~magic/terravision.ps.gz or http://www.ai.sri.com/pubs/files/778.pdf (GOOG 000371-390) (Chang Decl., Ex. 23).

TABLE OF ABBREVIATIONS
(continued)

TerraVision Video	TerraVision: A High Speed Terrain Visualization System (1994) and Architecture and Initial Performance of TerraVision (1994) (G-T_0018) (Chang Decl., Ex. 24). A transcript of the TerraVision Video was made during the deposition of Stephen Lau (Lau Depo. at 164:19-167:20, 171:6-174:24).
TerraVision Source Code	Source code for TerraVision (G-T_0020) (Chang Decl., Exs. 20 (excerpts), 34).
Clinger, GraphicsNet '95	Marke Clinger, "GraphicsNet '95: Integrated voice, video, graphics and data network using asynchronous transfer mode (ATM)," *ACM SIGGRAPH Computer Graphics*, 30(1), pp. 10-18 (Feb. 1996) (Chang Decl., Ex. 26).

I. INTRODUCTION

TerraVision was an application for providing data blocks describing three-dimensional terrain to a renderer. It was developed and publicly used in the mid-1990s, at least a year before the application for the '189 patent, and is thus prior art to this patent. There is no genuine dispute about how the TerraVision application worked. It was a software application designed to render three-dimensional terrain from data blocks stored remotely in a multi-resolution hierarchy. As the user roamed about the terrain, additional data blocks were downloaded in coarse-to-fine order so as to display the viewpoint in as high a resolution as possible at all times.

Under a correct reading of the Court's claim construction, there is also no genuine dispute that the public use of the TerraVision application disclosed every limitation of at least claims 1, 3, 12 and 14 of the '189 patent, rendering them invalid. At the same time, if Skyline's reinterpretation of claims 7, 8, 18 and 22 is adopted, then there is also no dispute that these claims are anticipated by TerraVision, and are also invalid.[1]

It is only by ignoring the claim language and reinterpreting the Court's constructions that Skyline can hope to distinguish TerraVision. As disclosed in discovery, Skyline relies on distinctions having no basis in the claims. Skyline asserts that TerraVision required use of a high-end computer instead of an ordinary PC, but the claims say nothing about excluding high-end computers, merely reciting an "apparatus" with a "processor." Skyline asserts further that TerraVision was designed for use on a high-speed network rather than the Internet, but the claims merely recite a "communications link," and TerraVision was used on the Internet in any case. Skyline asserts that TerraVision was intended to be used by only a few simultaneous users in a few locations rather than by a wide range of users in diverse locations, but the claims only

[1] Skyline contorts the Court's claim construction in an attempt to capture Google Earth. Because the law is settled that the same construction must apply to both noninfringement and invalidity, however, either these claims are not infringed or they are invalid.

require one user or one apparatus. Skyline also attempts to recast its invention as a method of downloading elevation data rather than a "method of providing data blocks describing three-dimensional terrain to a renderer," even though the '189 patent says very little about the download of elevation data.

Ignoring the claim language and gerrymandering the Court's constructions, however, do not create any genuine issues of disputed fact for purposes of summary judgment. On the undisputed facts and under a correct reading of the Court's claim construction, the TerraVision application anticipates at least claims 1, 3, 12 and 14, and accordingly, Google seeks summary judgment of anticipation with respect to these claims. To the extent that the Court accepts Skyline's reinterpretation of claims 7, 8, 18 and 22, summary judgment of invalidity should be granted on those claims as well because TerraVision—like Google Earth—does not download tiles required by the renderer *before* downloading excess tiles.

II. BACKGROUND

A. The '189 patent

The '189 patent is directed to a "method of providing data blocks describing three-dimensional terrain to a renderer." The object of the invention is:

- "to provide methods and apparatus for displaying on a remote computer actual images of an area as seen from a viewpoint which is chosen interactively;"
- "to provide methods and apparatus for training a pilot to fly a preplanned flight course while allowing the pilot to see the view seen at any point along the flight course at substantially any desired angle;"
- "to provide methods and apparatus for displaying on a client computer images of ground terrain stored in a remote server, which are conveyed to the client via a network, preferably the Internet;" and
- "to provide methods and apparatus for streaming data required for rendering three-dimensional terrain images on a remote computer."

'189 patent at col. 1:64-2:14. In the claimed invention, the data blocks belong to a hierarchical

structure organized into multiple levels of resolution. *See, e.g., id.* at col. 16:29-31; *see also* Chang Decl., Ex. 4 at 12-15. The renderer of the '189 patent provides "one or more coordinates in the terrain along with indication of a respective resolution level" to another object and receives "a first data block which includes data corresponding to the one or more coordinates, from a local memory" from another object. *See, e.g.*, '189 patent at col. 16:28-37 (claim 1); *see also* Chang Decl., Ex. 5 at 8-10. If the first data block is not at the indicated resolution level, additional, higher resolution data blocks are downloaded from a remote server. *See, e.g.*, '189 patent at col. 16:38-43; *see also* Chang Decl., Ex. 5 at 10-12.

Skyline has asserted claims 1, 3, 7, 8, 9, 12, 14, 18, 19, 22, 23, and 24 of the '189 patent. All of these claims include the elements described above. '189 patent at col. 16:28-20:43. In addition, claims 3 and 14 are independent claims which recite the further requirement of downloading data blocks of lower resolution before downloading data blocks of higher resolution. *Id.* at col. 16:66-67, 18:66-19:1. Claims 7 and 18 are also independent claims which recite the further requirement of downloading excess blocks not currently needed when not downloading blocks required by the renderer. *Id.* at col. 17:58-61, 20:21-24. Claims 8 and 22 are dependent on claim 7 and 18, respectively, and also require operation over the Internet or a connection to the Internet. *Id.* at col. 17:62-64, 20:37-38.

B. The Prior Art: TerraVision

TerraVision was a "high-speed graphics application that allow[ed] a user to interact in real time with a synthetic 3D photo-realistic view of a large terrain." Chang Decl. Ex. 21 (MAGIC Final Report at GOOG 362). Like the '189 patent, TerraVision had the following capabilities:

- "to display on a remote computer earth image data that was stored on a server somewhere else … from a viewpoint chosen interactively by the user;"

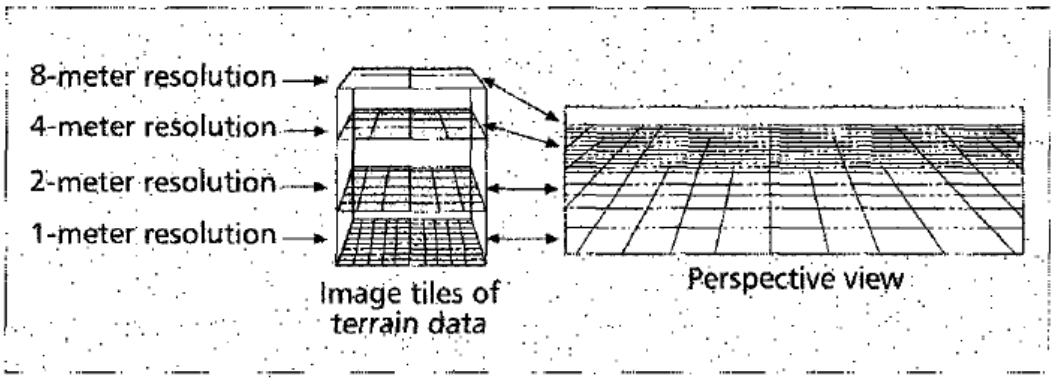
- "to train a pilot to fly a preplanned flight course while allowing the pilot to see the view, see it at any point along the flight course at substantially any desired angle;"
- "to display on a client computer images of ground terrain stored in a remote server which are conveyed to the client via a network [or] via the Internet;" and
- "to stream data required for rendering three-dimensional terrain images on a remote computer."

Id., Ex. 14 (Lau Depo. at 51:8-53:18).

SRI International, and specifically Yvan Leclerc and Stephen Lau, developed the TerraVision application in the early to mid 1990s. *Id.* (Lau Depo. at 32:25-33:21, 34:6-21). TerraVision was developed as part of a government-funded research project called MAGIC ("Multidimensional Applications and Gigabit Internet(work) Consortium"). *Id.*, Exs. 21 (MAGIC Final Report at GOOG 358), 22 (MAGIC IEEE Article at GOOG 347-50). The MAGIC project had three components: a high-speed network, a network-based storage system, and TerraVision. *Id.* SRI was responsible for developing TerraVision. *Id.*

TerraVision was a software application, designed to run on a Silicon Graphics computer. Undisputed Facts ¶ 61. As software, it was embodied in source code. *See* Chang Decl., Exs. 20, 34 (TerraVision Source Code dated April 1996). To a person skilled in the art, this source code describes the operation of the TerraVision application. *See, e.g.*, Feiner Decl. ¶¶ 51-61 (explaining relevant source code functions). In addition, the features and operation of TerraVision—as well as numerous public demonstrations—were described in publications about the MAGIC Project, including the MAGIC Final Report (May 1996), and the MAGIC IEEE Article (May/June 1996). Chang Decl., Exs. 21, 22; *see also* Undisputed Facts ¶ 60.

As reflected in the source code as well as the MAGIC Final Report and the MAGIC IEEE Article, TerraVision was a method of and apparatus for "providing data blocks describing three-dimensional terrain to a renderer." Undisputed Facts ¶¶ 61-70. In TerraVision, the data blocks belonged to a "resolution hierarchy" or "pyramid":



■ Figure 3. *Relationship between tile resolutions and perspective view. (Source: SRI International)*

Undisputed Facts ¶ 71; *see also* Chang Decl., Ex. 22 (MAGIC IEEE Article at GOOG 349). Each level of the pyramid was made up of equal-sized subimages called "tiles." Undisputed Facts ¶¶ 63, 71. Tiles with image ("color") data were referred to as orthographic image or "OI" tiles, while tiles with elevation data were referred to as digital elevation model or "DEM" tiles. *Id.* ¶¶ 64-65. Tiles were referenced in TerraVision by specifying the resolution level and the (x,y) coordinates. *Id.* ¶ 72; *see also* Chang Decl., Ex. 21 (MAGIC Final Report at GOOG 359, stating, "TerraVision requests these tiles from the ISS by specifying the level and the (x,y) coordinates of the tiles that it needs").

The renderer in TerraVision determined what tiles were visible and provided the (x, y) coordinates and resolution level for these tiles to another object, which identified the tiles resident in memory. Undisputed Facts ¶¶ 72-79; *see also* Feiner Decl. ¶¶ 69-72 (ThreeDWidgetGenerateVisible() calls ThreeDWidgetCalcVisibility() to create a quadtree of visible tiles; this quadtree is provided to ParseQuadTree()). The tiles resident in local memory were then provided to the renderer for rendering. Undisputed Facts ¶¶ 80-83; *see also* Feiner Decl. ¶¶ 73-75 (ParseQuadTree() identifies the visible tiles resident in memory and provides this quadtree to ThreeDWidgetGenerateVisible(), which calls ThreeDWidgetRenderPrimitive() to create the mesh that would be rendered during the next frame).

If the tiles resident in memory were not at the indicated resolution level, additional, higher resolution tiles were downloaded from a remote server over a communications link in coarse-to-fine order. Undisputed Facts ¶¶ 84-91; *see also* Feiner Decl. ¶¶ 76-79 (GenerateandSendRequests() loops through a list including all the visible tiles in coarse-to-fine order, either updating the usage time of a tile already in memory or placing a tile not in memory on the download request list).

TerraVision also downloaded excess tiles for the surrounding area based on a "bloated" view matrix. Undisputed Facts ¶¶ 94-99; *see also* Feiner Decl. ¶¶ 80-82. Theses tiles were downloaded via the MAGIC Network and via the broader Internet. Undisputed Facts ¶¶ 100-02; Feiner Decl. ¶¶ 83-85.

TerraVision was publicly used and demonstrated in the United States from at least 1993 to 1996. Undisputed Facts ¶ 60. For example, the MAGIC Final Report and the MAGIC IEEE Article both identify numerous demonstrations at various public conferences, including the 1994 and 1995 MAGIC Symposia, Supercomputing '95 and SIGGRAPH '95. Chang Decl. Exs. 21 (MAGIC Final Report at GOOG 366-70), 22 (MAGIC IEEE Article at GOOG 355); *see also id.* Exs. 25-26, 30-33. These facts are also established and corroborated by the testimony of Stephen Lau (one of the inventors of TerraVision), who was present for many of these demonstrations. *See* Undisputed Facts ¶ 60 (citing deposition testimony). In 1994, Mr. Lau also assisted in the preparation of a video with two segments describing TerraVision. Chang Decl., Exs. 14 (Lau Depo. at 161:15-162:23, 163:15-177:21), 24, 32. This video was shown at the 1994 MAGIC Technical Symposium. *Id.* It illustrates TerraVision in operation, including the downloading or "streaming" of data blocks in real-time on an as-needed basis. *Id.*

III. ARGUMENT

At least claims 1, 3, 12 and 14 of the '189 patent are anticipated by the public use of TerraVision in the United States.[2] 35 U.S.C. § 102(b). While anticipation is a question of fact, there is no genuine factual dispute that TerraVision constitutes prior art to the '189 patent. The application for the '189 patent was not filed until February 26, 1999, and Skyline has not claimed any earlier priority date. Undisputed Facts ¶¶ 58-59. The TerraVision source code dates from April 1996 and there is overwhelming and undisputable evidence that TerraVision was in public use from at least 1993. *Id.* ¶ 60. There is also no genuine factual dispute regarding the scope or content of TerraVision. The parties agree on how TerraVision worked. *Id.* ¶¶ 61-102.

Any disagreement centers on the meaning of the claims, i.e., whether TerraVision reads on the claims as properly construed—and that is an appropriate question for the Court to resolve on summary judgment. *See Akamai Techs., Inc. v. Cable & Wireless Internet Servs., Inc.*, 344 F.3d 1186, 1192, 1195 & n.4 (Fed. Cir. 2003) (factual question of anticipation is contingent upon a proper claim construction). Google submits that as a matter of law TerraVision anticipates at least claims 1, 3, 12 and 14 under a correct reading of the Court's claim construction. It is only by reinterpreting the Court's construction that Skyline reaches a contrary opinion. At the same time, if the Court accepts Skyline's interpretation of claims 7 and 18 regarding excess data blocks (offered by Skyline in an attempt to capture Google Earth), Google submits that as a matter of law TerraVision also anticipates claims 7, 8, 18 and 22.

[2] Google submits that there are a number of different bases under 35 U.S.C. § 102 for finding anticipation of the asserted claims of the '189 patent based on TerraVision, publications describing TerraVision and other prior art references, but restricts the present motion to the public use of TerraVision and to claims 1, 3, 7, 8, 12, 14, 18 and 22 solely for the purpose of simplifying the issues for summary judgment.

A. Legal Standard for Summary Judgment of Anticipation

Summary judgment in a patent case, as in any other case, is appropriate where there is "no genuine issue as to any material fact and … the moving party is entitled to a judgment as a matter of law." Fed. R. Civ. P. 56(c); *see also Schering Corp. v. Geneva Pharms., Inc.*, 339 F.3d 1373 (Fed. Cir. 2003) (affirming grant of summary judgment of invalidity). "A patent is invalid for anticipation if a single prior art reference discloses each and every limitation of the claimed invention." *Id.* at 1377. "[A] prior art reference may anticipate without disclosing a feature of the claimed invention if that missing characteristic is necessarily present, or inherent, in the single anticipating reference." *Id.* (citations omitted). Thus, although a single prior art reference may fail to disclose the claimed invention expressly, if the natural and invariable practice of the reference would necessarily and inherently meet all the limitations of the claim, then there is anticipation. *See, e.g., Arthrocare Corp. v. Smith & Nephew, Inc.*, 406 F.3d 1365, 1373-74 (Fed. Cir. 2005) (prior art reference that did "not explicitly identify" a feature anticipated patent where "a person of skill in the art would understand" that the reference contained the feature); *Schering Corp.*, 339 F.3d at 1378-1380.

Although the claims of an issued patent are presumed to be valid, and must be found invalid by clear and convincing evidence, the presumption of validity is not conclusive. In particular, where a prior art reference—such as TerraVision in the instant case—was not cited to the Patent and Trademark Office during the patent's prosecution, the movant may more easily carry its burden. *See EWP Corp. v. Reliance Universal, Inc.*, 755 F.2d 898, 905 (Fed. Cir. 1985). In fact, "prior art not before the PTO may so clearly invalidate a patent that the burden is fully sustained merely by proving [the] existence [of the prior art] and applying the proper law." *American Hoist & Derrick Co. v. Sowa & Sons, Inc.*, 725 F.2d 1350, 1359-60 (Fed. Cir. 1984).

B. TerraVision Constitutes Prior Art Pursuant to 35 U.S.C. § 102(b)

A reference constitutes prior art if it was "in public use or on sale in this country, more than one year prior to the date of the application for patent." 35 U.S.C. § 102(b). The statutory phrase public use "includes any use of the claimed invention by a person other than the inventor who is under no limitation, restriction, or obligation of secrecy to the inventor." *New Railhead Mfg. L.L.C. v. Vermeer Mfg. Co.*, 298 F.3d 1290, 1297 (Fed. Cir. 2002).

There is no genuine dispute that TerraVision has been in public use since at least June 1996, more than one year prior to the date of the application for the '189 patent (February 26, 1999). Undisputed Facts ¶ 60. Skyline has admitted that the '189 patent is not entitled to claim priority to any earlier application date. *Id.* ¶ 59. The TerraVision source code is dated April 1996 (or earlier). Chang Decl., Exs. 20, 34; Feiner Decl. ¶ 51. The MAGIC Final Report and the MAGIC IEEE Article (both dating from May/June 1996) report on numerous public demonstrations of TerraVision from 1993 through 1996. *Id.*, Exs. 21 (MAGIC Final Report at GOOG 367-370), 22 (MAGIC IEEE Article at GOOG 355). Stephen Lau, one of the inventors of TerraVision, testified that he performed many of these demonstrations himself and also that he prepared video segments for demonstrating the operation of TerraVision. *Id.*, Ex. 14 (Lau Depo. at 159:11-162:23, 169:1-12 & 175:6-8). This testimony is corroborated by conference proceedings as well as the TerraVission video itself. *Id.*, Exs. 24, 32. Even Skyline's expert acknowledges learning about TerraVision in the 1990s. *Id.*, Ex. 15 (Manocha Depo. at 36:8-23). Furthermore, there is no evidence that Mr. Lau or anyone else at SRI was "under [any] limitation, restriction or obligation of secrecy" to the inventors of the '189 patent. In light of this overwhelming evidence, there can be no genuine dispute that TerraVision was in public use more than one year prior to the date of the application for the '189 patent, and that TerraVision therefore constitutes prior art to the '189 patent within the meaning of 35 U.S.C. § 102(b).

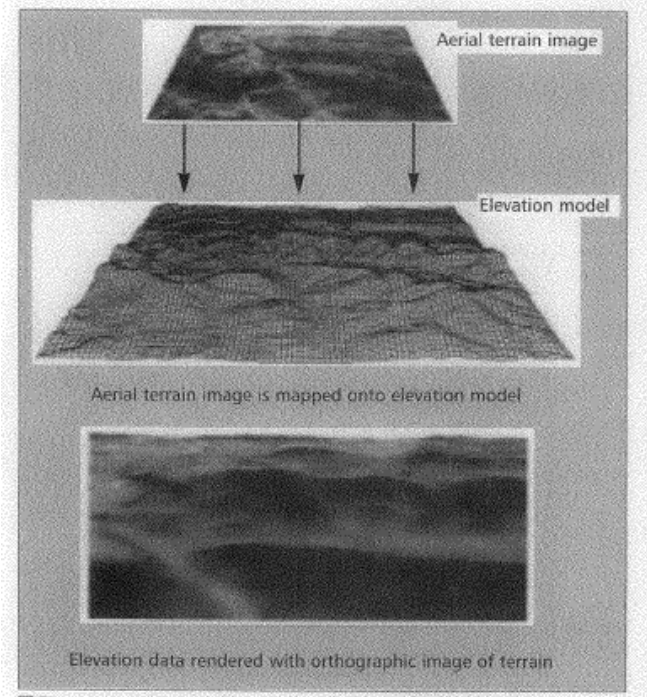
C. TerraVision Discloses Every Limitation of Claims 1, 3, 12 and 14

Each and every limitation of claims 1, 3, 12 and 14 of the '189 patent are found either expressly or inherently in TerraVision. Indeed, there is no real dispute that TerraVision practices all but one of the limitations at issue. Undisputed Facts ¶¶ 61-102. And with respect to this one disputed limitation—downloading one or more additional data blocks—there is no dispute about how the TerraVision source code worked. *Id.* ¶¶ 84-89.

1. Downloading one or more additional data blocks

All of the asserted claims (with minor variations) require "downloading from a remote server one or more additional data blocks at a resolution level higher than the resolution level of the first data block which include data corresponding to one or more coordinates if the provided block from local memory is not at the indicated resolution level."

In TerraVision, both OI tiles (with image or "color" data) and DEM tiles (with elevation data) are downloaded from a remote server and provided to a renderer, which renders the three-dimensional terrain. *See* Undisputed Facts ¶¶ 62-70, 84-85. The rendering process is illustrated in the MAGIC IEEE Article:



■ Figure 4. *Mapping an ortho-image onto its digital elevation model. (Source: SRI International)*

Change Decl., Ex. 22 (MAGIC IEEE Article at GOOG 349). An OI tile (aerial terrain image) would be overlaid on a DEM tile (elevation model) to produce the three-dimensional terrain. *Id.*

However, at least in the version of TerraVision reflected in the source code, the mechanism for downloading OI tiles and DEM tiles from the remote server varied.[3] In one mechanism, DEM tiles were downloaded from the remote server initially when the user first started using TerraVision. *See* Undisputed Facts ¶ 85; *see also* Feiner Decl. ¶ 78 (TerraVisionInitDataSet() calls TsRequestDems() to download the DEM tiles from remote server). Thus, when the user moved about the terrain, there was no need to download more DEM tiles since the tiles resident in memory were already at the indicated resolution level. *Id.* The OI tiles were downloaded from the remote server on an as-needed basis. Undisputed Facts

[3] In contrast, the MAGIC Final Report and the MAGIC IEEE Article disclose downloading OI tiles and DEM tiles using the same mechanism, that is, downloading one or more additional tiles (representing *either* image or elevation data) as needed by the renderer in the manner Skyline agrees practices the '189 patent. Chang Decl., Exs. 21 (MAGIC Final Report, *e.g.*, at GOOG 364), 22 (MAGIC IEEE Article at GOOG 349-50). Google understands that Skyline disputes the content of these disclosures.

¶¶ 84, 86-89; Feiner Decl. ¶¶ 77-78 (GenerateAndSendRequests() calls TsmReqTile() to download additional OI tiles from a remote server). In particular, one or more additional OI tiles were downloaded from a remote server if the data block already in local memory was not at the indicated resolution level. *Id.* This coarse-to-fine strategy is described in the MAGIC Final Report and the MAGIC IEEE Article and illustrated in the TerraVision Video. Undisputed Facts ¶¶ 90-93; Chang Decl., Exs. 21 (MAGIC Final Report at GOOG 364), 22 (MAGIC IEEE Article at GOOG 350), 24 (TerraVision Video ("What's happening is that, when we first move to a new area, the high-resolution tiles are not available in local memory, so TerraVision is forced to use low-resolution tiles. At the same time as the display is being processed, TerraVision is requesting higher resolution tiles from the server. As they arrive, TerraVision uses these higher-resolution tiles, and image becomes progressively better focused…. The same principals are used for 3D views. But here, we have the added complexity that, for oblique views, we need to use high-resolution data in the foreground, and lower-resolution data in the background.")). Essentially, TerraVision would display the best-available data from the OI and DEM tiles resident in local memory, and then request additional OI tiles in coarse-to-fine resolution order if the tiles resident in memory were not at the indicated resolution level. *Id.*

The parties do not dispute that the TerraVision source code operated in this way. Rather, the dispute turns on the legal issue of whether the additional OI tiles downloaded are "data blocks [describing three-dimensional terrain]." Skyline asserts that only data blocks with elevation data describe three-dimensional terrain, even if both elevation data *and* image data are used to render three-dimensional terrain. Google submits that the downloading of *either* OI tiles (image tiles) or DEM tiles (elevation tiles) satisfies the Court's construction of this term.

The Court construed "terrain" as "the surface features of an area of land, an object, or a material, including color, elevation, and existing objects or structures on the land, object or material." Chang Decl., Ex. 4 at 19. Both OI tiles and DEM tiles include data describing "terrain" as construed by the Court:

> In order to render an image, TerraVision requires a digital description of the shape and appearance of the subject terrain. The shape of the terrain is represented by a two-dimensional grid of elevation values known as a *digital elevation model* (DEM). The appearance of the terrain is represented by a set of aerial images, known as *orthographic projection images* (ortho-images), that have been specially processed (i.e., ortho-rectified) to eliminate the effects of perspective distortion, and are in precise alignment with the DEM.

Id., Ex. 22 (MAGIC IEEE Article at GOGO 349); *see also* Undisputed Facts ¶¶ 66-68. The OI tiles included image ("color") data and described the "appearance" of the terrain, while the DEM tiles included elevation data and described the "shape" of the terrain. *Id.* Both image and elevation data were used to render the three-dimensional terrain in TerraVision. *Id.*

The Court further construed "data block describing three-dimensional terrain" as "a block or collection of data or digital information that represents or describes a section of three-dimensional terrain at a particular resolution level and that includes any additional data overlaid on the digital image of the terrain, such as altitude, labels or optional objects. *Id.*, Ex. 4 at 12. An OI tile is a "data block," i.e., "a block or collection of data or digital information." Undisputed Facts ¶ 64; Chang Decl., Ex. 4 at 11. Tiles in TerraVision were "small, equal-sized subimages … stored as independently accessible items on the [remote server], or as independent files in a local file system." Chang Decl., Ex. 21 (MAGIC Final Report at GOOG 359); *see also* Undisputed Facts ¶ 63. Moreover, an OI tile is also a "data block describing three-dimensional terrain." OI tiles described the "appearance" of the three-dimensional terrain (while DEM tiles described the "shape" of the three-dimensional terrain). Undisputed Facts ¶¶ 66-67. OI tiles (like DEM tiles) also had a particular resolution level and were stored in "resolution hierarchies."

Id. ¶¶ 71-72. Thus, an OI tile was a collection of data describing a section of three-dimensional terrain at a particular resolution level.

An OI tile did not need to have elevation data to constitute a "data block describing three-dimensional terrain." Both elevation and image data were used to render the three-dimensional terrain in TerraVision, and therefore an OI tile "represents or describes a section of three-dimensional terrain." Undisputed Facts ¶ 68. A DEM tile, of course, would also meet this definition. *Id.* The fact that neither an OI tile nor a DEM tile by itself *completely* described the three-dimensional terrain does not mean that these tiles did not represent or describe a section of three-dimensional terrain.[4] Furthermore, the '189 patent is not about downloading elevation data from a remote server. Indeed, the '189 patent only mentions elevation data once, and makes no distinctions between downloading elevation data and downloading images of terrain from airborne or satellite cameras. *See* '189 patent at col. 8:15-37.

TerraVision practiced the step of "downloading from a remote server one or more additional data blocks at a resolution level higher than the resolution level of the first data block which include data corresponding to one or more coordinates if the provided block from local memory is not at the indicated resolution level." It downloaded at least additional OI tiles at a resolution level higher than the resolution level of the first block if the provided OI and DEM tiles from local memory were not at the indicated resolution level.

[4] Skyline's attempt to thread the needle between invalidity and noninfringement on this issue cannot succeed. Google Earth, like the version of TerraVision described in the source code, treats elevation data and image data separately and does not download data blocks including *both* iamge and elevation data (i.e., the complete three-dimensional terrain). *See* Motion for Summary Judgment of Noninfringement at 16-17. This is in contrast to the preferred embodiment described in the specification of the '189 patent, which describes downloading a single data block having both color and elevation data together. '189 patent at col. 8:32-36.

2. Other limitations

Apart from the limitation of downloading "one or more additional data blocks," there is no real dispute that TerraVision disclosed the other limitations of claims 1, 3, 12 and 14 of the '189 patent. Undisputed Facts ¶¶ 62-83, 90-93. Skyline's expert agreed that TerraVision had a "hierarchical structure." Chang Decl., Ex. 8 at ¶ 34 ("I do not disagree that the data blocks in the TerraVision system belong to a hierarchical structure."). He also offered no rebuttal to Dr. Feiner's testimony regarding the disclosure of a "renderer" in the TerraVision source code.

Skyline's expert did argue that TerraVision was not a "method of providing data blocks describing three-dimensional terrain," that there was no "first data block" in TerraVision and that additional lower resolution data blocks in TerraVision were not downloaded before higher resolution data blocks, citing the very same arguments made with respect to downloading of DEM tiles. However, regardless of how DEM tiles were downloaded, it cannot be genuinely disputed that TerraVision provided DEM tiles as well as OI tiles for rendering. Undisputed Facts ¶¶ 68-70. Furthermore, the "first data block" as construed by the Court is simply "the first data block provided to the renderer from the local memory corresponding to the specified coordinates." Chang Decl., Ex. 4 at 17. Again, regardless of how DEM tiles were downloaded, it cannot be genuinely disputed that TerraVision provided a first data block (with image and elevation data) to the renderer from local memory. Undisputed Facts ¶¶ 80-83. Finally, all additional data blocks downloaded in TerraVision (OI tiles) were requested in coarse-to-fine order, that is, lower resolution before higher resolution, and the source code discloses modes of operation where TerraVision both requested *and received* tiles in coarse-to-fine order. Undisputed Facts ¶¶ 90-91; *see also* Feiner Decl. ¶ 79 (tsmGetTile_web and tsmHttpUrlToBuffer use http protocol to request *and receive* tiles in strict coarse-to-fine order).

The other differences identified by Skyline's expert have no basis in the claims. For example, Skyline's expert refers to the use of a high-end SGI workstation in TerraVision. However, claims 1, 3, 12 and 14 are directed generally to a "method" and "apparatus," and are not limited to a PC. Skyline's expert also refers to the use of TerraVision on the MAGIC network (which he argues is not part of the Internet). However, claims 1, 3, 12, and 14 are directed generally to the use of a "communications link," and are not limited to the Internet. *See also infra* Part III.D.2 (SRI demonstrated TerraVision running over the broader Internet as well as the MAGIC network). Finally, Skyline's expert argues that TerraVision was not "scalable." However, claims 1, 3, 12 and 14 require only a method performed by one person and a single apparatus. Skyline cannot read these limitations into the claims to distinguish the TerraVision prior art.

Thus, there is no genuine dispute of fact that TerraVision practices the remaining limitations of claims 1, 3, 12 and 14. Accordingly, because TerraVision also discloses downloading "one or more additional data blocks," claims 1, 3, 12, and 14 are anticipated, and summary judgment of invalidity as to these claims should be entered.

D. Under Skyline's Interpretation, TerraVision Also Discloses Every Limitation of Claims 7, 8, 18 and 22

Claims 7, 8, 18 and 22 include the further limitation of downloading excess data blocks "when not downloading blocks required by the renderer." The Court construed this limitation to mean downloading excess blocks "during periods of time when the local computer, or a connection thereof, is not downloading data blocks in response to coordinates received from the renderer." Chang Decl., Ex. 5 at 20.

In asserting infringement of claims 7, 8, 18 and 22 against Google Earth, Skyline has distorted the Court's construction. However, if Skyline's interpretation is accepted, Skyline also

runs into the prior art and, accordingly, Google conditionally moves for summary judgment of invalidity as to these claims as well.

Skyline's interpretation of the Court's construction is not correct. It asserts that the "excess block" limitation is satisfied even where required blocks and excess blocks are mixed together on the same download request list without any assigned priority, simply because one block is not downloaded at the same time as another block. *See* Motion for Summary Judgment of Noninfringement at 19-20. This is not what was meant by either the claims or the Court's construction. The specification of the '189 patent makes clear that the required blocks are downloaded first, and then excess blocks are downloaded "when the communication link is not needed to download blocks required for currently rendered images." *See* '189 patent at col. 3:29-32. Further, it is only if the "queue is empty" that the cache manage fills the cache memory with excess data blocks. *Id.* at col. 15:63-67 ("[I]f the queue is empty, cache manager 74 fills cache memory 32 with the blocks within the range of the current viewpoint…."); *see also* Fig. 8. Skyline's interpretation eliminates this prioritization of required blocks over excess blocks, and should be rejected. It is contrary to the ordinary meaning of this phrase and inconsistent with the disclosures in the specification.

While Google believes that Skyline's reinterpretation of the Court's construction is both incorrect and improper, it conditionally moves for summary judgment of anticipation as to claims 7, 8, 18 and 22 in the event that the Court adopts this interpretation. The TerraVision source code—like Google Earth—did not prioritize the download of required blocks over excess blocks.

1. Claims 7 and 18: Downloading Excess Data Blocks When Not Downloading Blocks Required by the Renderer

There is no genuine dispute of fact that TerraVision requested data blocks required by the renderer together with "excess" data blocks falling within a "bloated" view matrix. Undisputed Facts ¶¶ 94-99. This "bloated" view matrix included all the tiles within the current view matrix (i.e., the visible tiles) as well as excess tiles surrounding the current viewpoint. *Id.* Thus, there was one download request list or "queue" in the TerraVision application with required blocks and excess blocks mixed together.[5] According to Skyline, on a computer with a single network connection which transmits one bit at a time sequentially, "the excess blocks which are downloaded will necessarily occupy the network connection at different times from those in which the blocks required by the renderer are being transmitted." Thus, at least under Skyline's interpretation, the TerraVision application would satisfy this limitation of claims 7 and 18.

2. Claims 8, 22: Internet

Claims 8 and 22 depend on claim 7, and further require downloading blocks "via the Internet" or having a communication link "to the internet." There is no genuine dispute of fact that TerraVision disclosed these further limitations of claims 8 and 22. There is no dispute that TerraVision downloaded data blocks over the MAGIC network, and, under the Court's construction (as properly interpreted), the MAGIC network was part of the Internet. Undisputed Facts ¶¶100, 102. Furthermore, there is no *genuine* dispute that TerraVision also downloaded data blocks over the broader Internet. *Id.* ¶ 101. Google submits that either use of TerraVision over the MAGIC network or use of TerraVision over the broader Internet satisfies the Court's construction as fairly and properly read.

[5] In contrast, the TerraVision Tech Note and the MAGIC IEEE Article both disclose alternative embodiments that would satisfy the claims as properly construed. Chang Decl., Ex. 22 (MAGIC IEEE Article at GOOG 351 (disclosing prioritizing download request list)), 23 (TerraVision Tech Note at GOOG 388 (disclosing "secondary list of 'tiles to prefetch if there's time'")).

Skyline does not dispute that TerraVision was used on the MAGIC network. Undisputed Facts ¶ 100. TerraVision was designed in conjunction with the MAGIC project. *See, e.g.*, Chang Decl., Ex. 22 (MAGIC IEEE Article at GOOG 347-48). This project included the development of an experimental, high-speed network called the MAGIC network. *Id.* This ATM network connected at least the University of Kansas, the Earth Resources Observation System Data Center at the U.S. Geological Survey, the Battle Command Battle Laboratory at the U.S. Army Combined Arms Command, the Minnesota Supercomputing Center, Sprint, and U.S. West. *Id.* In its construction, the Court specifically noted that it did not intend to "exclude networks such as the Internet2, which are built on separate physical infrastructure, but are essentially updated and experimental version of the current Internet." Chang Decl., Ex. 5 at 22 n.17. This exactly describes the MAGIC network—a "testbed" or experimental version of the then-current Internet built on a separate physical infrastructure. *See, e.g.*, Chang Decl., Exs. 21 (MAGIC Final Report at GOOG 358), 22 (MAGIC IEEE Article at GOOG 347, 348). Thus, the MAGIC network was part of the "Internet" as construed by the Court. At a minimum, the MAGIC network had a "connection to the Internet," and satisfied at least claim 22. Undisputed Fact ¶ 102.

There is also undisputed evidence that TerraVision was used on the broader Internet. Undisputed Facts ¶¶ 101. The MAGIC Final Report states that "SRI demonstrated TerraVision running over the Internet at the JPL, connected to [remote servers] in Menlo Park." Chang Decl., Ex. 21 (MAGIC Final Report at GOOG 369). This report further notes:

> An interesting consequence of the coarse-to-fine strategy is that TerraVision can also run over slower networks. As the user moves around the terrain over a slow network, TerraVision continues to display at its normal rate. But because the network is slow, by the time a coarse tile has arrived, the user has moved to a new location, so a different coarse tile is requested. Consequently, as the user moves the terrain, he or she sees only a coarse-resolution view of the terrain. If the user stops, eventually all of the tiles are delivered and the user sees a high-resolution view of the scene.

Id. at GOOG 364. The TerraVision source code also includes functions for downloading tiles over the Internet using the http protocol, including tsmGetTile_web and tsmHttpUrlToBuffer. *See* Feiner Decl. ¶ 84. TerraVision was demonstrated at SIGGRAPH '95 in Los Angeles through SIGGRAPH's "GraphicsNet," another publicly accessible network. Chang Decl., Ex. 26 (Clinger, GraphicsNet '95); *see also id.*, Ex. 14 (Lau Depo. at 90:7-18). Mr. Lau also testified that he routinely ran TerraVision from his home and hotel rooms using a 9600 baud modem and other slow-speed connections. Chang Decl., Ex. 14 (Lau Depo. at 37:4-38:5). He also testified that neither Lawrence Berkeley National Laboratory (who developed the remote storage system for TerraVision) nor SRI (who developed TerrraVision) was on the MAGIC network, and so therefore had to access the MAGIC network over the Internet. *Id.*, Exs. 14 (Lau Depo. at 38:10-22, 281:25-283:1), 22 (MAGIC IEEE Article at GOOG 356). These are clear and unrebutted disclosures showing that TerraVision also was used on the broader Internet. This is clear and convincing evidence not only that TerraVision was operated on a machine with a "connection to the Internet," but that data blocks in TerraVision were downloaded "via the Internet."

IV. CONCLUSION

For the foregoing reasons, Google respectfully requests that the Court grant summary judgment of invalidity, finding at least claims 1, 3, 12 and 14 of the '189 patent invalid for anticipation based on the public use of TerraVision. Furthermore, in the event that the Court adopts Skyline's reconstruction of claims 7, 8, 18 and 22 of the '189 patent, Google further requests that the Court grant summary judgment of invalidity as to these claims as well.

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Respectfully submitted,

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Certificate of Service

I hereby certify that, on January 19, 2007, I caused a true and accurate copy of the foregoing document to be served upon all counsel of record for each party by complying with this Court's Administrative Procedures for Electronic Case Filing.

By: /s/ Carolyn Chang
Carolyn Chang